

and Arne Enström. He also regularly hosted a number of visiting scientists. With the move into his new laboratory in 1946–7, Caspersson expanded the range of research techniques employed, adding both electron microscopy and cell fractionation. Of particular note is that electron microscopist Fernández-Morán, whose research I will discuss in the next chapter, worked with the Caspersson group for a couple of years on nerve fiber ultrastructure. Despite this, and despite his becoming the first editor of a new journal, *Experimental Cell Research*, Caspersson did not set the agenda for cell biology. Like Brachet, the focus of his research was limited to nucleic acids, not the full range of cell activity. A major reason for his limited impact may have been his preoccupation with instrumentation and failure to apply the instruments in developing new biological ideas after the early 1940s.<sup>16</sup>

One interesting feature of the pursuits of Bensley, Brachet, and Caspersson is that in all three cases the research projects emerged from existing recognized problems in subdomains of what would become cell biology. Perhaps as a consequence, none of them created a laboratory with the breadth of research in cell biology as emerged at the Rockefeller Institute in the 1940s. Caspersson came the closest by incorporating instruments for both cell fractionation and electron microscopy. However, these techniques played a rather peripheral role as the laboratory's focus remained on cytochemistry.

#### 5. ADDING A BIOCHEMICAL PERSPECTIVE TO THE ROCKEFELLER LABORATORY

Around the time that Claude's focus began to change from cancer to normal cells, the group working with him in Murphy's laboratory expanded. The first to join the laboratory, in 1939, was Keith Porter (I will return to Porter in Section 6). Then, in 1941, George Hogeboom, who had completed his medical degree at Johns Hopkins in 1939, brought skills in cytochemistry and biochemistry. Initially he worked most closely with Murphy on his cancer projects. For example, in his first year, he carried out chemotherapy studies on tetra-methyl-ortho-phenylene-daimine (OTM) and rotenone, substances

<sup>16</sup> An approach very similar to Caspersson's, but more fruitful, was pursued at Columbia University under the leadership of Arthur Pollister and Franz Schrader. Hewson Swift, a graduate student at Columbia during this period, did pioneering research establishing the constancy of the relation between number of chromosomes and amount of DNA measured spectrographically (Swift, 1953). After finishing his degree, Swift moved to the University of Chicago and set up a similar laboratory focused on measuring DNA content of nuclei. He subsequently employed electron microscopy and created an important center for cell biology. He served as program chair for the first meeting of the American Society of Cell Biology and became its third president.